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truthfully say that although there have been briars, there have been more roses; while there have been clouds, there has been much sunshine; while many paths have been hard, others have been delightfully pleasant; and while there have been discouragements, there has been much appreciation.

Never has nursing covered so wide a field as at the present time and while each branch and new development have their power for good, the power of the quiet faithful nurse ministering to suffering and distress in homes yields first place to none.

DISEASES OF THE EAR, NOSE AND THROAT

By CHARLES R. C. BORDEN, M.D.

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SECOND PAPER

For the purpose of study, the middle ear may be likened to a toy drum. It has a round barrel-like body with a thin vibrating surface covering either end. In the case of the middle ear, the inner end of the drum will not be considered, as it plays a minor rôle in common diseases of the ear. Again, in the middle ear, the round barrel part of the organ has two openings entering into it which are of great importance. The eustachian tube opens into the anterior surface, and the passage from the mastoid process to the middle ear is situated in the upper posterior surface. Both openings are of great importance in middle ear diseases as they are the avenues through which infection finds its way into these important cavities.

Diseases of the middle ear are frequent and are important for several reasons. They are often painful, always dangerous and at times may become a menace to life itself. If allowed to persist for any length of time, they are apt to be followed by more or less impairment of function and resulting deafness.

The causes of middle ear disease are many. Generally speaking, any diseased, or inflamed condition of the nose or throat may give rise to a similar condition in the middle ear. Common colds, grippe, scarlet fever, measles and diphtheria are the most common causes. Constitutional diseases, such as pneumonia and typhoid fever are also causes of disease in this location. The severer types of the contagious diseases are particularly apt to cause aural complication. The percentage in diphtheria averages about 4 per cent; in scarlet fever about 11 per cent and in measles about 28 per cent. These statistics, of 952

cases of diphtheria, 746 cases of scarlet fever and 456 cases of measles were taken from the records of the Contagious Department of the Boston City Hospital. Grippe epidemics (so called), vary in severity; at times the percentage of the ears involved is large, at other times, it is much less. The severity of the aural infection also varies from year to year.

Inflammation or infection of the middle ear cavity is known as acute otitis media. It usually begins as a simple inflammation. At the outset, the inflammatory process is brought about by the partial or complete closing of the eustachian tube which causes a partial vacuum in the middle ear cavity. The rarified air draws the drum membrane inward and, at the same time, if severe enough, sucks the serum from the small blood vessels in the lining membrane of the cavity. As this fluid collects in the cavity, the drum is slowly distended. When the pressure is great enough to push the drum outward beyond its normal limits, pain develops. Naturally the greater the stretching of the drum, the greater the pain. Usually, in the early stages, the distension comes from the serum alone. After a time, infection of the lining membrane of the cavity takes place and the serum turns to pus. The formation of pus is more rapid than that of the serum as a rule. Consequently, in the average cases, rupture of the drum membrane takes place earlier when pus is present. Occasionally, on the other hand, pus is formed slowly and does not produce sufficient pressure to rupture the drum. Again, for some preexisting reason, the drum may be very much thicker than normal. In this event, the increase in the thickness may prevent spontaneous rupture of the membrane. In scarlet fever, measles and diphtheria the drum is often very much thickened.

One drop of pus under pressure will often cause a great rise in temperature. Not infrequently when the drum is opened only a single drop of pus will escape, yet the temperature at the time may be very high. The following day pus may be pouring from the ear yet the temperature in most cases will have fallen to normal. Thus it will be seen that a tiny drop of pus under pressure is far more dangerous than a copious discharge from the same locality which has free drainage.

Symptoms of middle ear inflammation are not difficult to recognize in the average case. Pain is naturally the most prominent symptom as it occurs among both adults and children in this disease. To regard earache as a necessary symptom of aural disease, however, is a common mistake. In acute otitis media, following common colds, grippe, etc., the highly disagreeable sensation of earache is the usual condition. On the other hand, in scarlet fever, measles and diphtheria pain is more often absent than present when the ear is involved. The writer has

seen many cases of both acute otitis media and mastoiditis in which the patient suffered no pain whatever.

In young children, elevated temperature is often the first symptom to be noticed. It usually occurs toward night or during the night. Sudden rise of temperature in young children is always suspicious of middle ear disease, particularly if no other cause for the fever can be determined. This is especially true if the patient is suffering at the same time from another disease which affects the nose or throat. Children who are mouth-breathers are subject to middle ear disturbances every time they acquire a head cold.

In early childhood, temperature resulting from middle ear disease is apt to be rather high. It is not uncommon for a child to suddenly develop a temperature of 104 or even higher from a simple middle ear infection. Within the month the writer had two cases in which the temperature went to 105° and 106° respectively from this disease. Both were cases of a mixed infection of scarlet fever and measles. Adults, on the other hand, do not often reach as high a degree of temperature from the simple middle ear infections. Very young children, either with or without elevation of temperature, often become very restless or fussy, as a result of a middle ear inflammation.

Temperature, like pain, is a symptom which is usually regarded as a reliable and constant factor in middle ear diseases. Such is not the case. It is a treacherous symptom upon which to base a diagnosis. The absence of temperature cannot be regarded as conclusive evidence that acute inflammation or infection does not exist. Mastoiditis often occurs with a normal or very slightly elevated temperature, particularly in the contagious diseases. Within twenty-four hours of the time this article was written, the writer operated upon a case of mastoiditis occurring in a young boy recovering from scarlet fever. There was only a very slight elevation of temperature but there was a large amount of pus in both the middle ear and the mastoid cavity. In this case the bone had been eaten away sufficiently to form a fistulous tract from the inside of the mastoid cavity to the external tissues.

Occasionally the first symptom to be noted is the presence of serum or pus escaping from the middle ear. This is positive proof that inflammation is present in that organ. Aural discharges without previous symptoms are quite common in contagious diseases.

The importance of acute otitis media cannot be overestimated. In itself it is a rather simple disease to combat in the average case; if diagnosed early and vigorously treated, the process can be overcome with comparative ease. On the other hand, if the proper treatment is

delayed or feebly carried out, the disease may pass on to other structures adjacent to this organ and a decidedly dangerous complication may develop. Immediately above the roof of the middle ear is the cranial cavity. If the inflammatory process finds its way from the middle ear to the cranial structures, meningitis or brain abscess is apt to follow. Many such cases develop each year as a remote result of acute otitis media. Another complication which is apt to develop from this disease is thrombosis of the lateral sinus or infection of the internal jugular vein, as it is often called. This large vessel normally runs through the deeper part of the mastoid cavity, being contained in a channel in that bone.

The duration of acute otitis media varies with the severity of the infection. Simple catarrhal cases, where no infection is present, may subside in a day or so and give no further trouble. If a true infection has been present and treatment has been thorough and efficient, the inflammatory process lasts from a few days to two weeks or more, gradually subsiding as the time goes on. If it persists for more than two weeks, suspicion should be directed to some abnormal condition in the situation which is keeping the process active. Different writers give different periods of time for the disease to be present. From two to four weeks are named as the limit for an acute process. After that time, it passes to the chronic stage and is then referred to as chronic otitis. Before acute otitis media has reached the chronic stage, however, a great amount of damage may have been done to the delicate structures which go to make up the hearing apparatus. The writer has seen the entire drum membrane destroyed in a few days by a very active inflammation. Unless the pressure is quickly relieved, a large area is apt to slough away leaving a permanent perforation which will later contract and cause a serious impairment of hearing. Measles is a disease which more than any other is likely to cause great destruction of the drum membrane in a very short space of time. In the writer's experience, this disease is the greatest enemy to the hearing apparatus which exists. This is particularly true when measles occurs in conjunction with scarlet fever. The percentage of aural involvement in mixed infections of scarlet fever and measles in a series of seventy cases was over 44 per cent.

In the various diseases, except scarlet fever, acute otitis media usually develops when the other acute symptoms are at their height. In scarlet fever, otitis media and mastoiditis may develop at the time the acute symptoms are most active, but in this particular disease, they are more apt to develop later, when the acute symptoms

have entirely disappeared. The writer has known the aural complications to develop as late as one hundred days after the acute symptoms had disappeared.

Chronic otitis media begins where acute otitis media ceases. This is, of course, an entirely arbitrary period. For the sake of description, it may be said to begin four weeks after the onset of the infection. In other words, chronic otitis media is simply an acute otitis media which has refused to subside. In the chronic stage it may persist for many months or years. Many persons have had a chronic discharge from one or both ears for most of their lifetime. The discharge may be considerable in amount or very scanty; it may be very thick pus or a thin, watery fluid; it may be constant, or it may vary from day to day. Usually such conditions are more or less dependent upon the time of year. Head colds increase the amount of discharge as a rule. Certain individuals hear best when the discharge has dried up; others hear best when the discharge is active. (This is a very grave symptom.)

Chronic otitis media is one of the greatest problems aurists have to face. To cure such cases is a hard task. Simple measures usually fail to give results and operative procedures for the relief of such conditions rank with the most difficult. It is a common mistake to treat such cases by syringing. Physicians who have had little or no experience in aural surgery at times feel competent to advise in the treatment by ordering the above procedure. In practically every case of chronic otitis media, syringing the middle ear cavity with watery solutions does decided harm. The middle ear is usually filled with granulation tissue and the watery solutions cause it to increase in amount and size. No one but a trained aurist should ever attempt to treat cases of chronic otitis media. Next to cases of profound deafness, chronic otitis media is the most trying and difficult work which the aurist attempts. There is a wide variety of opinion as to the proper treatment of such cases, most of which are prone to result in failure. Paradoxical as it may seem, the only practical way to cure them is to prevent them. In the past they have been comparatively common cases in the community; the future will doubtless yield a smaller number. In the writer's experience there is already a marked falling off in the number of chronic otitis media cases which apply to the hospitals for relief. This is unquestionably brought about by the better understanding of the relationship between the nose, throat and middle ear. The large number of adenoid operations performed each year in the large cities is bound to have its effect in this respect. In the Boston City Hospital, alone, there were over 3000 adenoid operations performed last year. Not only will the removal of adenoids

make for a smaller number of chronic otitis media cases, but it will decrease the number of acute otitis media cases as well. In the contagious Department of the Boston City Hospital there is already a noticeable decrease in the number of cases of mastoiditis.

Inasmuch as chronic otitis media is such a broad subject for consideration, we must reluctantly pass it by and simply state that the principal danger from chronic otitis media is the extreme liability of such cases to suddenly and without warning develop into meningitis, brain abscess or the lateral sinus thrombosis. These three dreaded complications, as a rule, are brought about not by acute otitis media but by chronic otitis media.

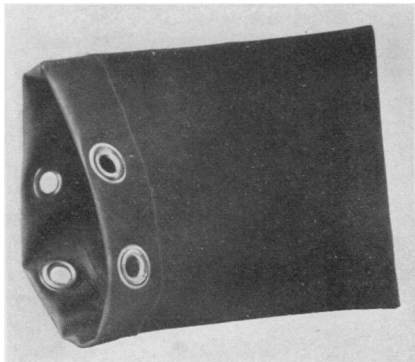
The treatment of acute and chronic otitis media will be given after the consideration of mastoiditis.

IMPROVISING HOSPITAL APPLIANCES

By MARY J. MERRIMAN, R.N.

Willard, N. Y.

A rubber sheet cover for mattress. Illustration Number 1 shows a rubber sheet cover for a mattress that we have found very useful and profitable in the care of destructive and untidy patients who persist in taking off the ordinary rubber sheet, throwing it under the bed, out of the windows, etc. This is put on over the mattress, bag-like, and is laced at one end with cord, through the grommets. It is quite sanitary, as it can be easily cleansed and pulled off when the mattress is taken out for airing. Destructive patients do not tear this as they would an ordinary sheet. If the rubber sheeting is too wide for the required purpose, the excess may be used to cover sand bags, etc.



No. 1. RUBBER SHEET COVER FOR
MATTRESS
(PHOTOGRAPHED FROM SMALL MODEL)

Frame or standard for skeleton.
The accompanying photograph shows the standard or frame that

we use in our class room for the purpose of bringing before the pupils a clearer and more definite outline of the skeleton. It has been found more satisfactory than the old method of hanging the skeleton in a